THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

No. 59. NOVEMBER 1912.

LVIII.—*Notes on the* Apidæ (*Hymenoptera*) *in the Collection of the British Museum, with Descriptions of new Species.*

By Geoffrey Meade-Waldo, M.A.

(Published by permission of the Trustees of the British Museum.)

I. Subfamily *Megachilinæ*.

The following notes were made during a recent rearrangement and expansion of the bees of this subfamily.

A considerable number of types have, of necessity, come under notice during this work, and the fact that many of the species have been either ignored or misunderstood by other workers has made the present appear a good opportunity in which to make an effort to facilitate the identification of these species by means either of keys or notes on synonymy.

The species which appear to be least understood are those described by the late Frederick Smith, and to these special attention has been paid. Much valuable information has already been published on the British Museum collection of bees, notably by Prof. T. D. A. Cockerell in his paper "Notes on some Bees in the British Museum" (Trans. Amer. Ent. Soc. xxxi. p. 309, 1905), and by A. Ducke (Deutsch. ent. Zeitschr. p. 362, 1910). Friese's valuable monograph of the subfamily ('Das Tierreich,' 28 Lieferung) has been of great assistance.

As Prof. Cockerell rightly remarks (*l. c.* p. 309), Smith's descriptions, though good for the time when they were written, are inadequate for modern requirements, since the number of described species has so vastly increased.

The types of all the new species here described are in the British Museum.

My best thanks are due to Professor Poulton, F.R.S., for the loan of Wallace's Malayan *Megachile* described by F. Smith, the types of which are in the Hope Department of the Oxford University Museum.

Eriades, Spin.

Eriades rugifrons, Smith.

This species was described as *Chelostoma rugifrons* (Catal. Hymen. Brit. Mus. ii. p. 220, 1854) from Georgia, U.S.A.

In his description Smith makes no mention of the clypeus, which is very similar to that of *Megachile* subgenus *Eumegachile* : *i. e.*, very short, much broader than long, broadly emarginate, and laterally provided with blunt tubercles. The length given (5 lines) is an underestimate, the correct length is 13 mm. The insect has a superficial resemblance to *E. grandis,* Mor., the form of the clypeus being very similar.

Osmia, Panz.

There are but few types of this genus in the British Museum collection. Smith described three species from the Angara River, Siberia, which may be separated as follows :—

1.	Legs entirely black, robust insect. L. 11 mm.	*ephippiata.*
	Legs partially ferruginous, more slender insects.	2.
2.	Legs ferruginous (coxæ and trochanters black), thorax clothed with fulvous pubescence, abdominal tergites with lateral fasciæ of pale pubescence, scopa pale fulvous. L. 9 mm.	*rubripes.*
	Tarsi ferruginous, thorax clothed with black pubescence, abdominal tergites with lateral fasciæ of rich golden pubescence, scopa golden. L. 13 mm.	*rufitarsis.*

O. ephippiata is a *Melanosmia,* Schmied., very near *O. pilicornis,* Sm., but with the abdomen wholly black-haired. The vertex and thorax are clothed with *ochraceous* pubescence (*teste* Smith's original description), not reddish yellow (rotgelb) as stated by Friese (' Das Tierreich,' Lief. 28, p. 130).

Osmia rubripes is very near *O. rufohirta*, Lep., and belongs to the subgenus *Acanthosmia*, Thoms.

Osmia laboriosa, Sm., from Yarkand, somewhat resembles *O. rufigastra*, Lep., from Algeria, but differs in having the scape, mandibles, and anterior margin of the clypeus reddish, whereas in *O. rufigastra* all these parts are black. Cockerell (Trans. Amer. Ent. Soc. xxxi. p. 333, 1905) writes a note on the species. The black markings on the abdomen give the insect a very distinct appearance. The North American species are satisfactorily dealt with by Cockerell.

Osmia jucunda, Smith.

Osmia jucunda, Smith, Catal. Hymen. Brit. Mus. i. p. 139. no. 36 (1853). ♀.

Osmia vidua, Gerst. Stettin. ent. Zeit. xxx. p. 345. no. 9 (1869). ♂ ♀.

Smith's type of *O. jucunda* from Albania agrees perfectly with specimens determined by Friese in the Edward Saunders collection. Gerstaecker described his species from Sicily.

Osmia apicata, Smith.

Osmia apicata, Smith, Catal. Hymen. Brit. Mus. i. p. 140. no. 37 (1853). ♀.

Osmia macroglossa, Gerst. Stettin. ent. Zeit. xxx. p. 349. no. 12 (1869). ♂ ♀.

Smith's type of *O. apicata* agrees perfectly with specimens in the Edward Saunders collection determined as *O. macroglossa* by Friese, and with a specimen from Corfu determined by Schmiedeknecht. In his 'Apidæ Europææ,' Schmiedeknecht suggests that they are co-specific, but does not synonymise them, being unable to determine *O. apicata* satisfactorily from the description.

Lithurgus, Latr.

Lithurgus rotundipennis.

Megachile rotundipennis, W. F. Kirby, Monograph of Christmas Island, p. 87 (1900).

This species from Christmas Island, Indian Ocean (*C. W. Andrews*), is a typical *Lithurgus*.

Lithurgus scabrosus.

Megachile scabrosus, Smith, Journ. Linn. Soc., Zool. iii. p. 134. no. 2 (1858).

Type n the Hope Department, University Museum, Oxford. In the British Museum there are specimens from

Rarotonga (*Wyatt-Gill*), Celebes (*Ida Pfeiffer*), and Amboyna (*F. Muir*).

Megachile, Latr.

Megachile albopicta, Smith.

Megachile albopicta, Smith, Catal. Hymen. Brit. Mus. i. p. 154 (1853). ♀.

Megachile flabellipes, Pérez, Espèces Nouv. Mellifères Barbarie, p. 23 (1895). ♂ ♀.

Both described from Algeria, and evidently co-specific. *M. flabellipes* has the scopa rather more golden than *M. albopicta,* but the latter is probably a rather faded specimen.

Megachile ceylonensis, Bingh.

Megachile ceylonensis, Bingh. Proc. Zool. Soc. Lond. p. 453, pl xv. f. 9 (1896). ♂.

The male of this species from Pundaloya, Ceylon (*E. E. Green*), is the type. The species is recorded as "*M. ceylonica*" in the Fauna Brit. India, Hymen. vol. i. p. 482: through an oversight, as it is correctly named in the key to the species (*l. c.* p. 472). The insect from Tenasserim described as the female of *M. ceylonensis* can have no affinity with it, and is totally different in appearance, so that the description of the male given in the 'Fauna of India,' Hymenoptera, vol. i., is misleading, since no mention is made of the most conspicuous character in the coloration of the abdomen.

A new name is thus necessary for this sex :—

Megachile caroli, nom. nov.

Megachile ceylonensis, Bingh. Fauna Brit. India, Hymenoptera, vol. i. p. 482 (1897).

The species is quite adequately described (*l. c.*).

Megachile stulta, Bingh.

Megachile stulta, Bingh. Fauna Brit. India, Hymenoptera, vol. i. p. 476 (1897). ♂ ♀.

This is certainly a composite species, and the female must be considered the type of *Megachile stulta,* Bingh.

The specimen marked by Bingham as his type of the male from Bangalore, S. India, agrees very well with a specimen from Dehra Dun, United Provinces, determined by Dr. R. C. L. Perkins as *M. schauinslandi,* Alfken, described from

Honolulu (Entom. Nachrichten, xxiv. p. 340 (1898), ♀). It would not be advisable, however, to synonymise these two species without examining the type of *M. schauinslandi*. In addition to this, the male of Alfken's species is as yet undescribed.

The description given by Bingham of the insect he considered to be the male of *M. stulta* in no way agrees with the specimen itself, and is misleading. From the description (*l. c.*) one would expect to find a black insect, the abdomen covered with ferruginous-red pubescence, more sparse than in the female, in which the abdomen is altogether covered with a ferruginous-red pile. In colour the male belongs to the *lanata* group, and has the first abdominal segment alone with any considerable clothing of ferruginous pubescence, although segments 2 and 3 bear narrow fasciæ; in the terminal segments the fasciæ of ferruginous pubescence give way to white.

Megachile bellula, Bingh.

Bingham describes both sexes of this species (Fauna Brit. India, Hymen. i. p. 476, 1897). In the Museum there are two specimens labelled as "*M. bellula*, Bingh., ♂," one of which is designated as the type. The species is certainly composite, the true male of *M. bellula* being the insect so labelled by Bingham, but *not* described. The name must be retained for the female, which becomes the type. The other male, labelled as type ♂ of *M. bellula* and described (*l. c.*), must be renamed

Megachile (*Eumegachile*) *binghami*, nom. nov.

Megachile bellula, Bingh. Fauna Brit. India, Hymen. i. p. 476, fig. 158 (1897). ♂.

Hab. Rangoon, Burma, vi. 1887 (type) (nec ♀); Yé Valley and Amherst, Tenasserim (*Bingham Coll.*).

This species is adequately described (*l. c.*). The sixth abdominal segment is provided with a distinct longitudinal carina, which is well shown in the text-figure.

There is also a series of five females from various localities in Tenasserim of an insect which is doubtless the true female of *M. binghami*.

♀. Head and thorax black, abdomen entirely clothed with rich reddish-brown pubescence, scopa reddish brown. Legs black, posterior tarsi reddish on the inner side. Head with thick, black pubescence, pleuræ with whitish pubescence of varying thickness. Wings fusco-hyaline. Clypeus very

short, broad, shallowly emarginate, with a slight longitudinal carina. Mandibles arched, 4-toothed. Posterior tibiæ very coarsely punctured. Metatarsus iii. cylindrical, only half as broad as tibiæ.

Length 15 mm.

The species can be separated from *M. bellula*, which is a *Megachile* sens. str., as fellows :—

M. (*Eumegachile*) *binghami*, ♀.	*M. bellula*, ♀.
Face without white pubescence.	Face with white pubescence.
Wings fusco-hyaline.	Wings hyaline.
Metatarsus iii. cylindrical, half as broad as tibiæ.	Metatarsus iii. as broad as tibiæ.

The following characters serve to separate the males :—

M. (*Eumegachile*) *binghami*, ♂.	*M. bellula*, ♂.
Anterior tarsi simple.	Anterior tarsi dilated.
Thorax clothed with dark pubescence.	Thorax clothed with pale, golden-brown pubescence.
Abdomen entirely clothed with fulvous pubescence.	Abdominal segments with fulvous apical fasciæ.
Abdominal segment 6 notched, with longitudinal carina.	Abdominal segment 6 simple, without longitudinal carina.

Megachile luculenta, Bingh.

Megachile luculenta, Bingh. Journ. Bomb. N. H. Soc. p. 249 (1890). ♀.

Hab. Tavoy, x. 1889 (type) ; Runjit Valley, Sikkim, v. 1894 ; Salween Valley, Upper Tenasserim, vii. 1892 and iv. 1893 (*Bingham Coll.*) ; Bhutan (*G. C. Dudgeon*).

It is necessary to revive this name, which has been made a synonym of *M. mystacea*, F. It is evident that Bingham has wrongly identified the Fabrician species (type in Banks Coll.) from Australia, though later he quite correctly remarks (Trans. Zool. Soc. p. 183, 1909) that *M. mystacea* has nothing to do with the African *M.* (*Eumegachile*) *rufiventris*, Guér.

M. luculenta is a considerably larger species, being 20 mm. in length, whereas *M. mystacea* is only 15 mm.

Megachile ornata, Smith.

Megachile ornata, Sm. Catal. Hymen. Brit. Mus. i. p. 183 (1853).
Megachile miniata, Bingh. Journ. Bomb. Soc. x. p. 199, fig. 6 (1896).

Smith did not know the locality of this species at the time he described it, but has written in "Sumatra" in the

Museum copy of the catalogue at a later date. Bingham's type of *miniata* from Deli, Sumatra, agrees perfectly with it.

Megachile bicaniculata, Cam.

Megachile bicaniculata, Cam. Proc. Zool. Soc. ii. p. 35 (1901).
Megachile caniculata, Cam. MS.

The type of *M. bicaniculata* is from the Malay Peninsula (3000 ft.), that of *M. caniculata* from Kuching (Sarawak). It is possible Cameron discovered that they were the same species, since no description of *M. caniculata* appears to have been published.

Megachile semivestita, Smith.

Chalicodoma semivestita, Sm. Catal. Hymen. Brit. Mus. i. p. 148. no. 5 (1853). ♂.
Megachile determinata, Sm. Descr. New Spec. Hymen. p. 69. no. 26 (1879). ♀.

These are sexes of the same species, though described from such widely separated places as India and Java. A male from Java (Horsfield Coll.) agrees in every detail with the type.

Megachile architecta, Smith.

Megachile architecta, Smith, Journ. Linn. Soc., Zool. ii. p. 46. no. 6 (1857).
Megachile tarea, Cam. Journ. Straits Asiat. Soc. xxxvii. p. 124 (1902).

These two species are from the same type locality (Sarawak, Borneo). A comparison of Smith's type from the Hope Department of the Oxford University Museum with Cameron's type in the British Museum proves them to be identical.

Megachile atrata, Smith.

Megachile atrata, Smith, Catal. Hymen. Brit. Mus. i. p. 182. no. 112 (1853). ♀.
Megachile fulvipennis, Smith, Descr. New Spec. Hymen. p. 68. no. 22 (1879). ♀.
Megachile viriplaca, Cam. Journ. Str. Asiat. Soc. xxxvii. p. 119 (1902). ♂.
Megachile shelfordi, Cam. Journ. Str. Asiat. Soc. xxxvii. p. 124 (1902). ♀.

Widely distributed through the Malay Archipelago. The type (*atrata*) is from the Philippine Islands ; Nicobars (*fulvipennis*) ; Borneo, Sarawak (*Shelford*) (*viriplaca* and

shelfordi) ; Sumatra ; Kota Raja, Achin, Puloweh (*Wallace, Meade-Waldo*) ; Tenasserim, Mergui (*Bingham*) ; Java (*Horsfield*) ; Singapore (*H. N. Ridley*).

Megachile dimidiata, Smith.

Megachile dimidiata, Sm. Catal. Hymen. Brit. Mus. i. p. 174. no. 88 (1853). ♀.
Megachile velutina, Sm. Catal. Hymen. Brit. Mus. i. p. 180. no. 105 (1853). ♀.

M. dimidiata (type in British Museum) has the pollen-brush deep fulvous in the centre and black laterally, *not* entirely black as Smith states; in his description of *M. velutina* he describes it correctly.

Bingham (Fauna Brit. India, i. p. 472) separates the two species on the colour of the antennæ and legs, which he says are fulvous red in *M. dimidiata* and black in *M. velutina*, although the original descriptions of both species distinctly state that the legs are fulvous, and specimens determined by Bingham himself as *M. velutina* have red antennæ and fulvous legs. The type of *M. velutina* was in the collection of the late J. S. Baly.

Megachile rotundiceps, Smith, ♀.

This species, described from Mt. Ophir (type in the Hope Department), belongs to the subgenus *Eumegachile*. The scopa is silver-white except sternite 5 (at the apex) and 6, where it is black.

Megachile terminalis, Smith, ♀.

As Friese rightly says, this species is like *M. ornata*, Smith, but differs in having the scopa black. Other differences, noticeable on comparing the types of the two species, are to be found in the considerably darker wings of *M. terminalis* and its slenderer form.

Megachile placida, Smith, ♂.

Described from Gilolo. The species has a slender, forward-curving spine on each of the anterior coxæ. Type in Hope Department.

Megachile laboriosa, Smith, ♂.

This species has a short tubercle on each anterior coxa. Type in Hope Department.

Megachile lateritia, Smith, and *Megachile albobasalis,* Smith.

These two species are extremely nearly related; they differ as follows :—

M. lateritia. (Type in Hope Department.)	*M. albobasalis.* (Type in B.M.)
No pale hair on median segment.	Median segment clothed with white hair.
Scopa deep foxy red, contrasting strongly with the brick-red clothing of the tergites.	Pubescence on tergites and scopa of the same shade of ferruginous.

M. lateritia was described from Aru and *M. albobasalis* from Murray Island, Torres Straits; there is also a specimen labelled as coming from Aru, but it is possibly an error.

Megachile tertia, D. T.

Megachile senex, Smith, Journ. Linn. Soc., Zool. vii. p. 92 (1865).
Megachile albiceps, Friese, Zeitschr. Hym. Dipt. iii. p. 243 (1903).

Friese is correct in suggesting that these are the same species. An examination of Smith's type shows that there is white pubescence on the prothorax, though this is not mentioned in his description.

Key to some African Species of Megachile *described by F. Smith.*

1.	Clypeus normal, truncate, 1–2 as broad as long (subgenus *Megachile*)	2.
	Cypeus apically emarginate, the sides of the emargination produced to form two teeth (subgen. *Amegachile*). Black; truncation of median segment and abd. tergite 1 white-haired; abdomen apically with ferruginous pubescence; scopa pale yellow, apically ferruginous; wings fuscous. L. 15 mm. (Zulu.)	*nasalis.* (= *volkmanni*, Fr.)
2.	Abdomen entirely clothed with ferruginous-red pubescence, vertex clothed with dark hairs, scopa pale ferruginous. L. 15 mm. (South Africa.)	*imitata.*
	Abdomen otherwise clothed	3.
3.	Thorax and abdomen black, all the segments with lateral patches of white pubescence, scopa golden fulvous, anterior wings fuscous. L. 16. (Natal.)	*consanguinea.*
	Thorax black, with ochraceous or rufous pubescence; abdomen with fulvous or grey pubescence	4.

4.	Abdomen basally red, apically black; wings clear hyaline. L. 12 mm. (Natal.) ..	*basalis*.
	Wings fusco-hyaline	5.
5.	Thorax with dense rufous pubescence; abdomen covered with grey pubescence, densest on apical margin of segments, scopa whitish. L. 13 mm. (Gambia.).	*discolor*. (=*fülleborni*, Fr.)
	Thorax somewhat sparsely clothed with ochraceous pubescence, abdomen and scopa fulvous	6.
6.	Metatarsus iii. flattened, abdominal tergites with broad apical fasciæ. L. 13 mm. (Cape of Good Hope.)	*eurymera*.
	Metatarsus iii. linear, fulvous pubescence more sparse towards apex. L. 16 mm. (Cape of Good Hope.)	*dorsata*.

The above species are not included in Friese's table of African *Megachile* ('Die Binen Afrikas,' p. 327 *et seq.*), and though included in 'Das Tierreich,' Lief. 28, p. 274 *et seq.*, it seems that a further short table taken from the actual types is not superfluous.

Of the species not tabulated by Friese in his African monograph, *M. maculata* and *M. perplexa* are omitted here, as it has not been possible to identify the types, which were in the collection of the late W. W. Saunders.

Megachile fervida, Smith.

Osmia fervida, Sm. Catal. Hymen. Brit. Mus. i. p. 142 (1853). ♂.
Megachile intricata, Sm. Descr. New Spec. Hymen. p. 61. no. 1 (1879). ♂ ♀.

Smith marked the male of *M. intricata* as his type, and it agrees in every respect with his *Osmia fervida*. There are no females of the latter species, but a female of *M. intricata* is certainly *Megachile* sens. str.

Megachile (*Eumegachile*) *paucipunctulata*, W. F. Kirby.

Megachile paucipunctulata, Kirby, Bull. Liverpool Museum, vol. iii. p. 21 (1900). ♀.
Megachile (*Eumegachile*) *sokotrana*, Friese, Zeitschr. Hym. Dipt. Bd. iii. p. 287 (1903). ♀.

An examination of Kirby's type proves that Kohl was correct in placing the species in this subgenus.

Megachile discolor, Smith.

Megachile discolor, Smith, Catal. Hymen. Brit. Mus. i. p. 157 (1853). ♀.
Megachile fülleborni, Friese, Zeitschr. Hym. Dipt. Bd. iii. p. 281 (1903). ♂ ♀.

This species is widely spread in Africa. Smith redescribed it from the Gambia. There are other specimens from Zungeru, N. Nigeria, iv. 1910 (*J. W. Scott-Macfie*); near Johannesburg, Transvaal (*A. J. Cholmley*); Salisbury, Mashonaland (*G. A. K. Marshall*); various localities in N.E. Rhodesia (*S. A. Neave*); N. Rhodesia, Sinapunga, 13. ii. 1911 (*Silverlock Coll.*); and Nyasaland, Karonga (*S. A. Neave*).

Megachile (*Amegachile*) *fimbriata*, Smith.

Smith's type of this species from the Gambia agrees well in all points of structure with a male of *M. cærulea*, Friese, determined by Friese himself, from Nyasaland. *M. fimbriata* has the abdomen clothed with fulvous pubescence; possibly *M. cærulea* may prove to be a subspecies.

Megachile (*Amegachile*) *bituberculata*, Rits.

Megachile bituberculata, Rits. Tijdschr. v. Entom. xxiii. Versl. p. xcvii (1880).

Megachile tuberculata, Smith, Descr. New Spec. Hymen. p. 63. no. 8 (1879). ♀. [Nec Smith, 1857.]

Megachile (*Amegachile*) *sjöstedti*, Friese, Zeitschr. Hym. Dipt. Bd. i. p. 72 (1901). ♀.

A specimen from Ilesha, S. Nigeria, 4. iii. 1910 (*J. J. Simpson*), determined by Dr. Friese, agrees with Smith's type of *M. tuberculata* in the British Museum.

Megachile (*Amegachile*) *nasalis*, Smith.

Megachile nasalis, Smith, Descr. New Spec. Hymen. p. 61. no. 2 (1879). ♀.

Megachile (*Amegachile*) *volkmanni*, Friese, Zeitschr. Hym. Dipt. Bd. iv. p. 299 (1904).

Smith's type from Zululand, in the British Museum, belongs to Friese's subgenus *Amegachile*.

Other specimens in the collection are from N.E. Rhodesia, Fort Jameson, 3800 feet, September 1910 (*S. A. Neave*), presented by the Entomological Research Committee (Tropical Africa); S.E. Congo Free State, Lufira River, Katanga, 3500 feet, 27. viii. 07 (*S. A. Neave*); and Lake Shirwa, Zomba, B.C.A. (*R. Newstead*).

Megachile æthiops, Smith.

Megachile æthiops, Smith, Catal. Hymen. Brit. Mus. i. p. 166. no. 68 (1853).

Lithurgus æthiops, Friese, Die Bienen Afrikas, p. 322 (1910).

This species is not a *Lithurgus*, as recorded by Friese in 'Die Bienen Afrikas,' p. 322. It resembles the European *M. muraria* superficially. The clypeus is somewhat of the *Chalicodoma* type and is crenulated apically.

Megachile habropodoides, sp. n.

♀. Nigra, hirsuta; capite, pleuris, abdominis segmentis 1–4 nigro-, segmentis 5 et 6 fulvo-ferrugineo-hirsutis; pronoto, mesonoto, scutelloque flavo-cinereo-hirsutis; scopa fulvo-ferruginea; clypeo subtruncato, apice duobus tuberculis minutis munito; mandibulis robustis, 4-dentatis; alis hyalinis.

Long. 15 mm.

♂. Similis sed clypeo flavo-cinereo-hirsuto, prosterno spatioque postoculari griseo pubescentibus; mandibulis apice ferrugineis, elongatis; tarsis anterioribus albidis, dilatatis, albo-tomentosis; coxa i. tuberculo subacuto instructa.

♀. Black; head, pleuræ, abdominal tergites 1–4, and legs for the most part covered with long black hair; pronotum, mesonotum, and scutellum clothed with a dense cinereous pile; abdominal tergites 5 and 6 covered with long ferruginous hairs; intermediate and posterior tarsi covered within by dark ferruginous hair. Scopa ferruginous red. Calcaria ferruginous. Wings hyaline. Clypeus subtruncate, broader than long, armed with two small tubercles at apex; mandibles massive, 4-toothed. The whole insect somewhat finely and evenly punctured. Metatarsus iii. normal, about as long as tibia.

Length 15 mm.

♂. Similar to the female, but with the face and clypeus covered with a long, dense, cinereous pile; postocellar region and prosternum clothed with thin white pubescence. Clypeus black at base, apically ferruginous, somewhat swollen. Anterior tarsi ivory-white, dilated, and fringed with long white hair, anterior coxæ provided with stout blunt tubercles. Abdominal segment 7 bidentate.

43 ♀♀, 5 ♂♂.

Hab. Khamba Jong, Sikkim, 15,000–16,000 feet, 15–30. vii. 1903. Collected by H. T. Walton on the Tibet Expedition (1903–4).

The colouring and general robust facies of this insect strongly recall *Bombus* and *Anthophora*.

Megachile (*Eumegachile*) *neavei*, sp. n.

♀. Nigra; facie nigro-, genis infra, thorace omnino, abdominis segmento primo omnino, segmento secundo lateribus albido-hirtis; segmentis 2 et 3 sparsim, 4–6 dense ferrugineo-tomentosis; scopa aureo-brunnea, basi pallidiore; clypeo basi tuberculo mediano lato instructo; mandibulis forcipatis; metatarsis angustis; alis fuscis.

Long. 16 mm.

♀. Black; the face densely and vertex sparsely covered with dark pubescence; the cheeks below, the whole thorax, first abdominal tergite wholly, and second abdominal tergite apico-laterally clothed with white pubescence; the rest of the abdomen covered with ferruginous-red pubescence, that on segments 2 and 3 much sparser; legs dark ferruginous, tarsi inclining to black, intermediate and posterior tarsi with rufous pubescence on the inner side. Scopa golden brown, paler at the base. Wings dark brown.

Clypeus very short, with a broad tubercle in the centre; mandibles arched, bidentate at apex. Punctured, mandibles and abdomen finely, clypeus, head, and thorax closely and somewhat coarsely. Metatarsus iii. slender, shorter than and about half as broad as tibia.

Length 16 mm.

♂. Similar to the female in general appearance, but with apex of clypeus and interantennal space covered with white pilosity, coxa i. with a short slender spine, abdominal segment 6 impressed at apex (as in *M. chrysorrhœa*).

2 ♀ ♀, 3 ♂ ♂.

Hab. Lower Luangwa River, N.E. Rhodesia, Sept. 1910 (*S. A. Neave*), type ♀; Ngoa, Nyasaland, 21. x. 1910 (*Dr. J. E. S. Old*), ♂ ♀; Fort Jameson, 3800 feet, Oct. 1910, and Luangwa to Petauke, Sept. 1910, N.E. Rhodesia (*S. A. Neave*), ♂ ♂.

This species comes nearest to *M. cornigera*, Fr., but differs in having the mandibles 3-toothed (in *cornigera* they are 5–6-toothed) and abdominal segment 1 and part of 2 white-, not black-haired.

Megachile battorensis, sp. n.

♀. *M.* (*Eumegachile*) *rufipedis* similis, sed non *Eumegachile*. Capite thoraceque antice fusco-, postscutello, segmento mediano, pleuris, abdominisque segmento primo basi pallide flavo-hirtis; segmentis abdominis 1 apice, 2 et 3 omnino ferrugineo-tomentosis, 4–6

sparsim nigro-hirtis; scopa ferruginea, apice obscuriore, nigra; pedibus brunneis, plus minusve flavo-pilosis; alis flavo-hyalinis, apice fuscis; tegulis ferrugineis. Clypeo truncato, plano, crasse punctato; mandibulis robustis, rugoso-striatis.

Long. 20 mm.

Similar to *M. rufipes*, F., differing as follows :—

M. (*Eumegachile*) *rufipes*, F.	*M. battorensis*, sp. n.
Clypeus extremely short, with median tubercle; mandibles arched, slender. (Subgenus *Eumegachile*.)	Clypeus normal, rather broader than long; no carina; mandibles stout, not arched. (Subgenus *Megachile*.)
Legs red.	Legs brown.

Length 20 mm.

Hab. Battor, Gold Coast, Oct. 1911 (*H. T. Palmer*), 1 ♀, type; Uganda Protectorate, between Sesiwa R. and Kampala, 3500–3750 feet, Aug. 1911 (*S. A. Neave*), 3 ♀; Entebbe, Uganda, Aug. 1911 (*C. C. Gowdey*), 1 ♀. Presented by the Entomological Research Committee (Tropical Africa).

In *Megachile* sens. str. the most nearly allied species appear to be *M. stephanelli*, Friese, also from W. Africa, and *M. kigonserana*, Friese, from German East Africa.

M. stephanelli has the scopa fuscous at base and grey at apex, and the wings smoky, while in *M. kigonserana* the thorax is wholly black-haired and the wings are hyaline.

Megachile (*Amegachile*) *frederici*, sp. n.

♀. Nigra, nitida; mandibulis (apice excepto), antennis basi, pedibus tegulisque rufis; facie argenteo-brunneo-, genis, pleuris sparsim, segmento mediano, abdominisque segmento primo lateribus albido-pilosis; scopa nigra, basi pallida; metatarsus iii. intus aureo-hirtis; clypeo apice emarginato; mandibulis robustis, apice 4-dentatis; alis plerumque cæruleo-micantibus, basi extremo hyalinis.

Long. 15 mm.

♀. Shining black; mandibles (except the apex), scape, flagellum beneath, tegulæ, and legs red; the face about the insertion of the antennæ clothed with silvery-brown pubescence, interspersed with a few black hairs; the pleuræ sparsely, median segment and abdominal tergite 1 densely clothed on the sides with white pubescence; scopa black, sternite 1 medially clothed with pale hair.

Wings with a bluish effulgence, the extreme base hyaline.

Clypeus about as broad as long, emarginate at apex, the

sides of the emargination produced to form two tubercles; mandibles massive, 4-toothed. Whole insect somewhat sparsely and evenly punctured, metatarsus iii. broader than tibiæ.

Length 15 mm.

♂. Similar to female, but smaller. Face and clypeus clothed with pale hair. First joint of anterior tarsi dilated, anterior coxæ armed with spines.

2 ♀♀, 1 ♂.

Gambia (*F. Smith Coll.*), ♂ ♀ (type); Zungeru, N. Nigeria (*Dr. W. Morrison*), ♀.

Most nearly allied to *M. bituberculata*, Rits., = *sjöstedti*, Fr., but at once separated from that species by the red legs and black ventral scopa. The species bore a MS. label "*cyanipennis*, Guér.," in F. Smith's Coll., and it certainly bears a superficial resemblance to that species.

Key to the Australian Species of Megachile *described by F. Smith.*

♀♀.

1.	Clypeus very short, 3–4 times as broad as long, more or less armed with tubercles at apex. Scopa pale, black species with pale pubescence	2. Subg. *Eumegachile.*
	Clypeus normal, 1–2 times as broad as long; variously coloured insects	5. Subg. *Megachile.*
2.	Clypeus truncate, the apex armed with a small tubercle or tubercles	3.
	Clypeus with a broad, medio-apical, subquadrate lobe, or else porrect, with the apex semicircular; wings fusco-hyaline	4.
3.	Apex of clypeus with small lateral tubercles; head very massive; wings fuscous; abd. tergite 1 with white pubescence; scopa pale testaceous. L. 21 mm. (Champion Bay.)	*monstrosa.*
	Clypeus with a small medio-apical tubercle; head normal; wings fusco-hyaline; abd. tergites 1 and 2 with white pubescence; scopa pale yellow. L. 18 mm. (Adelaide.)	*semiluctuosa.*
4.	Apex of clypeus with a broad, medio-apical, subquadrate lobe; face covered with dense golden pubescence; abd. tergite 6 with silver-grey pubescence. L. 13 mm. ("New Holland.")	*aurifrons.*
	Clypeus porrect, the apex semicircular; face sparsely clothed with grey hairs; abd. tergite 6 with golden pubescence. L. 12 mm. (Champion Bay.)	*nasuta.*

5.	Abdomen unicolorous; scopa bright fulvous	6.
	Median segment and abdomen basally with white pubescence. L. 14–15 mm.	7.
	Abdomen otherwise coloured; scopa pale; wings hyaline	9.
6.	Abdomen covered with bright fulvous pubescence; wings fuscous. L. 16 mm. (Australia.)	*ustulata.*
	Abdomen black, with violet iridescence; wings fusco-hyaline. L. 14 mm. (Richmond River.)	*pictiventris.*
7.	Wings dark fuscous; scopa black. (Champion Bay.)	*fumipennis.*
	Wings not dark fuscous; scopa white	8.
8.	Wings wholly dark fusco-hyaline, abd. tergite 3 black. ("New Holland.")	*lucidiventris.*
	Wings with basal half hyaline, fuscous apically; abd. tergite 3 laterally with white pubescence. (Champion Bay.)	*fabricator*
9.	Abdominal tergites with apical fasciæ of pubescence	13.
	Abdominal tergites 1–3 with apico-lateral marks of pale pubescence; abd. tergites 5 and 6 with golden-yellow or fulvous pubescence	10.
	Abdominal tergites 1 and 2 black, 3–6 ferruginous. L. 10 mm. (Queensland.)	*calida.*
10.	Face sparsely clothed with white pubescence; slender insects	21.
	Face clothed with golden pubescence; a robust insect. L. 13 mm. (Champion Bay.)	*sexmaculata.*
11.	Apex of clypeus simple. L. 11½ mm. (Tasmania.)	*leucopyga.*
	Apex of clypeus with a small tubercle or tubercles	12.
12.	Apex of clypeus with 2 small tubercles; abd. tergite 4 with narrow whitish-yellow fasciæ. L. 11 mm. (Adelaide.)	*eriadiformis.*
	Apex of clypeus with a small median tubercle; no fascia on abd. tergite 4. L. 10 mm. (Western Australia.)	*oblonga.*
13.	Sides of face sparsely covered with white pubescence, abdominal fasciæ narrow; smaller, more slender insects	16.
	Whole face (including clypeus) covered with dense ochraceous or fulvous pubescence, abdominal fasciæ broader; more robust insects	14.
14.	Face densely covered with fulvous pubescence; abd. tergite 5 partly and 6 wholly covered with fulvous pubescence. L. 12½ mm. (Western Australia.)	*chrysopyga*
	Face densely covered with ochraceous pubescence; abdomen unicolorous, with ochraceous fasciæ. L. 13 mm.	15.

15.	Disc of mesonotum with spots of ochraceous pubescence. (W. Australia.)..	*macularis*, D. T. (*maculata*, Sm.)
	Disc of mesonotum not so spotted. (Champion Bay.).....	*australasiæ*, D. T. (*imitata*, Sm.)
16.	All the abd. tergites black, with narrow apical fasciæ. L. 10 mm. (Hunter River.)	*simplex*.
	Abd. tergite 6 or 5 and 6 otherwise coloured	17.
17.	Abd. tergite 6 laterally ferruginous; a small insect. L. 8 mm. (Adelaide.)	*apicata*.
	Larger insects. L. 11 mm.	18.
18.	Abd. tergite 6 with a short griseous pilosity. (Tasmania.)	*ordinaria*.
	Abd. tergites 5 (apically) and 6 with pale fulvous pilosity. (Australia.)	*modesta*.

♂ ♂.

1.	Anterior tarsi dilated, anterior coxæ armed with spines	2.
	Anterior tarsi simple, anterior coxæ unarmed	3.
2.	Face covered with fulvous pubescence; abd. tergite 6 black. L. 13 mm. ("New Holland.")	*latipes*.
	Face covered with white pubescence; abd. tergite 5 with a patch of ferruginous pubescence. L. 11 mm. (Swan River.).....	*ferox*.
3.	Abd. tergite 6 entire, not emarginate; face with white pubescence	4.
	Abd. tergite 6 notched; face with yellow or fulvous pubescence; abdomen black, with white or white and ferruginous pubescence	5.
4.	Abd. tergite 6 bluntly rounded; abdomen black, with white pubescence basally; tergite 5 with a patch of ferruginous pubescence. L. 9 mm. (W. Australia.)	*canifrons*.
	Abd. tergite 6 truncate; abdomen wholly ferruginous. L. 8 mm. (Macintyre River.)	*abdominalis*.
5.	Abdomen black, with white pubescence basally; tergites 4 (apically) and 5 or 5 and 6 ferruginous; abdomen not coarsely punctured	6.
	Abdomen black, with white pubescence basally; apical tergites black; abdomen coarsely punctured	7.
6.	Tergite 6 deeply notched, tergites 5 and 6 ferruginous. L. 14 mm. ("New Holland.")	*ignita*.
	Tergite 6 faintly notched; an apical fascia on tergite 4 and tergite 5 for the most part ferruginous. L. 11 mm. (W. Australia.)	*erythropyga*.

7.	Tergite 1 with small apico-lateral tufts of white pubescence. L. 13 mm. ("New Holland.")	*punctata.*
	Tergite 1 wholly and 2 apico-laterally clothed with white pubescence. L. 11 mm. (W. Australia.)	*rugosa.*

Megachile exaltata, Smith.

Megachile exaltata, Smith, Catal. Hymen. Brit. Mus. i. p. 185 (1853). ♂.

Megachile incongrua, Smith, Descr. New Spec. Hymen. p. 78 (1879). ♂ ♀.

The older species, described from the male alone (Rio Tapajos, Brazil), is certainly co-specific with *M. incongrua* from Tunantins, of which both sexes are described.

Anthidium, F.

Anthidium (*Proanthidium*) *cimbiciforme*, Smith.

This is a valid species, and not synonymous with *A. laterale*, Latr., as stated by Friese, 'Bienen Europas,' iv. p. 153 (1898).

The yellow markings are much more profuse than in *laterale*. The antennæ and two curved lines on the disc of the mesonotum are yellow. In the males the apical segments of the two species show great disparity; in *A. laterale* the seventh abdominal tergite bears a short median tubercle, whereas in *A. cimbiciforme* the median prolongation is long and apically truncate.

The species was described from Albania.

Anthidium africanum, Smith.

? *Euaspis abdominale*, F. ♂.

There seems to be a great probability that Smith's species is the male of *E. abdominale*, F. Friese ('Die Bienen Afrikas') quotes *Stelis rufiventris*, Lep., as the male of that species, querying the locality (Brazil) given by Lepeletier (Hist. nat. Insect. Hymén. ii. p. 531), though Lepeletier himself seemed in no doubt about it.

Smith's type is 14 mm. in length, though he inexplicably gives 5 lines.

In the British Museum copy of Smith's Catalogue *A. africanum* is followed by a MS. note "♂ of no. 69," i. e. *A. bicolor*, this being the synonymy adopted by Friese in 'Die Bienen Afrikas.' In 'Das Tierreich' he has placed the two species separate. An earlier MS. alteration by Smith is a bracket uniting *A. africanum* and *A.* (now *Euaspis*) *abdominale*, F.; and this appears to be the correct solution.